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SPECIFICATIONS FOR THE DEVELOPMENT OF A
DIAGNOSTIC TEST OF BRAILLE READING SKILLS

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FOREWORD

The set of specifications presented in this report was developed as a part of a research project in braille testing and existing braille tests, which is being conducted at the American Printing House for the Blind. The major objective of the project is to develop a diagnostic test of braille reading skills to measure knowledge of the braille code and to offer diagnostic possibilities for those individuals found to be deficient in their ability to read the code. The purpose of the specifications is to provide guidelines for the selection of test categories, test items, format, etc. to be used in the instrument developed, and to select an appropriate mode for evaluating the instrument in a field trial with braille students. In addition, research has been done on the mechanics of reading braille to provide the basis for a mechanics evaluation checklist. The development of the specifications began with a thorough review of research and writings on all aspects of braille reading.



Abstract

This is a report of specifications written for a diagnostic test of braille reading skills being developed at the American Printing House for the Blind. The report is made up of three sections. Section I discusses braille mechanics and the research gathered and contains a braille mechanics checklist. Section II presents categories of the braille code and a breakdown of teaching units of the categories for Patterns: The Primary Braille Reading Program, developed by Eric Hamp. Also contained in this section are the categories of character difficulties in orders found in the literature, along with the braille code categories developed by Ashcroft and Henderson (1963). Section III gives information on existing braille tests and suggested rationale as to why they are, for the most part, no longer published or in demand.

Section I
Mechanics of Reading Braille

In reviewing the literature applying to the mechanics of braille reading it was found that much that is written agreed as to the importance of developing a systematic approach to the teaching of braille reading. As indicated in Caton, Pester, & Goldblatt (1979),

the mechanics of reading braille can be a very difficult process to teach, depending upon the child's background of experiences. Research shows that hand movement patterns in braille reading become established by third grade and usually do not change noticeably after that even with experience. Therefore, it would follow that students should be encouraged early to develop good tactual reading habits. The following are recommendations for good braille reading based on research findings:

1. Lowenfeld & Abel (1967) suggest placing the braille book flat on a table or desk of comfortable height with the bottom edge of the book parallel to the reader's body and his two hands parallel to the surface of the book.

2. The fastest and best reading performance scores were achieved by students who read using the index fingers of both hands. (Lappin & Foulke, 1973). The most efficient way to find the next line while reading braille is with the left hand while finishing the current line with the right.

3. Good readers read a considerable amount of materials with the hands functioning independently, the right hand covering approximately twice as much material alone as does the left hand alone. Apparently, this independence does not develop naturally with reading experience but must be taught. (Fertsch, 1942)

4. Studies have shown very good braille readers tend to use almost constant low pressure while reading. More pressure is applied when confronted with unfamiliar material. (Kusajima, 1974)

The following is a revised version of the braille mechanics checklist given in Harley, Henderson, & Truan (1979). Excessive up and down movements, undue pressure on the fingertips, poor posture, incorrect position of the book, and many other factors can cause reading problems among blind children. The checklist deals with all these problems. It is felt that a teacher should use reading material at the child's educational level to complete the Braille Observational Checklist in both silent and oral reading.

BRAILLE READING OBSERVATIONAL CHECKLIST

1. The pupil reads with

- ☐ a. fingers only
- ☐ b. fingers and remaining vision
- ☐ c. fingers for braille, but uses vision for pictures and objects
- ☐ d. other _____

2. The pupil reads with

- ☐ a. right hand
- ☐ b. left hand
- ☐ c. either hand
- ☐ d. both hands
- ☐ e. other _____

3. The pupil uses both hands in such a manner that
- ☐ a. left to right progression is smooth
 - ☐ b. the left hand finds the next line
 - ☐ c. the right hand finds the next line
 - ☐ d. both hands move together in a parallel motion
 - ☐ e. the right hand starts the next line before finishing the preceding line with the left hand
 - ☐ f. the left hand starts the next line before finishing the preceding line with the right hand.
 - ☐ g. the left hand does nothing but find the next line
 - ☐ h. other _____

4. The pupil holds his fingers so that they
- ☐ a. are perpendicular to the page
 - ☐ b. are almost parallel to the page
 - ☐ c. make an acute angle with the page
 - ☐ d. other _____

5. The pupil reads with
- ☐ a. index finger only
 - ☐ b. both index fingers
 - ☐ c. index and second fingers
 - ☐ d. index and second fingers of both hands
 - ☐ e. other _____

6. The pupil holds his book

- ☐ a. approximately parallel to the desk
- ☐ b. slanted to the right
- ☐ c. slanted to the left
- ☐ d. on his lap in front of the desk
- ☐ e. other _____

7. The pupil moves fingers across the dots

- ☐ a. stopping and rereading words or word segments frequently
- ☐ b. making frequent return sweeps
- ☐ c. at a steady rate
- ☐ d. other _____

8. The pupil reads letters with up and down motions (scrubbing)

- ☐ a. frequently
- ☐ b. occasionally
- ☐ c. seldom if ever

9. The pupil's posture when reading is

- ☐ a. excessively inclined
- ☐ b. inclined
- ☐ c. almost erect
- ☐ d. erect
- ☐ e. other _____

10. The pupil's attitude when reading is

- ☐ a. very tense
- ☐ b. tense
- ☐ c. almost relaxed
- ☐ d. relaxed

11. The pupil's pressure on his fingertips is

- ☐ a. light and even
- ☐ b. variable from light to heavy
- ☐ c. heavy but even
- ☐ d. heavy and uneven
- ☐ e. other _____

12. The pupil reads the book

- ☐ a. above elbow level
- ☐ b. at elbow level
- ☐ c. below elbow level

13. The pupil's chair allows feet to rest comfortably on the floor

- ☐ a. yes
- ☐ b. no

14. The pupil loses his place

- ☐ a. seldom if ever
- ☐ b. sometimes
- ☐ c. frequently
- ☐ d. other _____

15. The pupil reads orally by

- ☐ a. attending to each letter or contraction individually
- ☐ b. grouping letters into words
- ☐ c. grouping words into phrases or sentences
- ☐ d. other _____

16. The pupil's behavior during reading is characterized by

- ☐ a. head movements
- ☐ b. body rocking
- ☐ c. eye poking
- ☐ d. no mannerisms or unnecessary movements
- ☐ e. other _____

17. The position of the wrists is

- ☐ a. fairly straight in line with hands and arms
- ☐ b. sagging below line
- ☐ c. humped above line
- ☐ d. other _____

18. The pupil uses his remaining vision

- ☐ a. not at all
- ☐ b. for three-dimensional objects
- ☐ c. for braille reading assistance
- ☐ d. for pictures
- ☐ e. has no remaining vision
- ☐ f. other _____

19. The pupil has problems in

- ☐ a. locating the front
- ☐ b. the back
- ☐ c. the bottom
- ☐ d. or the top of a book (or page)
- ☐ e. no problem with the above

20. The pupil has problems

- ☐ a. turning pages in consecutive order
- ☐ b. locating spatial positions on page: up, down, left, or right (circle)
- ☐ c. other _____

Section II
Braille Code Categories

This section of the specifications includes a description of the categories of the literary braille code which will be used in developing test items relating to those parts of the code. Reviews of research have established numerous orderings and categories of the braille code (Aschcroft 1960; Kederis, 1962; Henderson, 1967; Bloomer, n.d.; Hoffman & Cook, 1970). In addition to these categories, an outline of braille terms was developed by Eric Hamp to be used in Patterns: The Primary Braille Reading Program. This outline consists of a categorization of the braille code based on linguistic principles, and was designed to assist in teaching young students to read.

All the categories of the braille code discussed above will be used in developing test items. The outline of braille terms developed by Hamp will be the primary guide for the overall organization of the test. Other categories will be used for the ordering of specific items within the test and for selecting specific contractions (braille units) within items. The outline of braille terms and the categories to be used follow.

I. Outline of Braille Terms

A. Prime Notions

1. Cell. A cell is an abstract space, twice as high as it is wide, within which six equidistant dots can be placed.
2. Shape. A shape is a single configuration made up of one to six dots. Therefore any cell can be filled by a shape.
3. Dot. A dot is the element of which shapes in a cell are composed; dots of a braille shape occur physically as bumps or bosses.

4. Braille unit. A braille unit comprises any shape(s) and its/their value (meaning or function). Example: go=1 shape, 1 braille unit; action=2 shapes, 1 braille unit. Braille units may be subdivided into three major types: letters, grams, and modulations.

B. Braille Units

1. Letters. These are either alphabetic or non-alphabetic.
 - a) Alphabetic letters (or letters proper) have a print-alphabetic value.
 - b) Non-alphabetic letters comprise
 - (1) Numbers (0-9), the decimal point, and the fraction bar.
Numbers may be thought of as letters of a numerical alphabet which spell number-words.
 - (2) Other braille units with abstract letter-like function.
These are the accent sign, the apostrophe, the asterisk, the ellipsis, and the hyphen or dash when used to indicate missing letters in words.
2. Grams. There are three kinds of grams: phonogram, morphogram, and logogram.
 - a) Phonogram - a braille unit having a phonetic value that would be written in print by more than one alphabetic symbol.
Phonograms include single shapes, such as th, ch, gh, the ing in sing, and the ea in read, and multi-shapes, such as the ation in nation, the ound in sound, the ong in long, the ance in dance, and the ity in pity. A complete list of phonograms follows.

ally	(Sally)	ing	(sing)
ance	(dance)	ity	(city)
and	(sand)	less	(bless)
ar	(car)	ment	(memento, comment)
ation	(nation)	ness	(finesse, business)
bb	(rubber)	of	(offer, off, doff)
ble	(table)	one	(none, alone, honest, money, cone)
cc	(occur)	ong	(along, wrong, tongue, longingly)
ch	(chair)	ou	(bout, thou, coup, coupe, hiccough, soup)
com	(come)	ought	(fought, bought, brought, thought)
con	(contrary)	ound	(wound, sound)
dd	(paddle)	ount	(count)
dis	(dispel)	ow	(now, cow, brown)
ea	(read)	part	(party, impartial)
ed	(red)	right	(fright, sprightly)
en	(pen)	sh	(wash, wish)
ence	(fence)	sion	(mission, fusion)
er	(certain)	some	(handsome)
ever	(several)	st	(first, street)
ff	(duffle)	th	(thou, bath, thing)
for	(forest)	the	(theatre, bathe, thee)
ful	(awful)	tion	(faction, portion, notion)
gg	(suggest)	under	(thunder)
gh	(ghost)	wh	(what, whether, who)
here	(adhere)	with	(within)
in	(pin)		

b) Morphogram - a braille unit having the value of a word element, i.e., inflectional endings, prefixes, and suffixes. Examples include the s in words, the ing in looking, the ed in looked etc. Note that the shapes that make these word elements may appear as phonograms or morphograms, depending on their function in words. A complete list of morphograms follows.

after	(afterlife)	ment	(ornament, monument)
ally	(mathematically)	ness	(openness, oneness)
ance	(avoidance)	one	(oneness)
and	(multiplicand)	part	(partial)
ar	(secular)	paid	(unpaid, repaid)
ation	(admir-tion)	question	(unquestionably, unquestionable)
be	(befriend)	quick	(quickly)
com	(commiserate)	right	(righteous, rightful)
con	(confuse)	said	(unsaid)
dis	(disengage)	sion	(aversion, confusion)
ed	(rubbed)	some	(lothsome)
en	(encephalogram)	spirit	(spiritual, dispirited)
ence	(providence)	through	(throughout, throughway)
er	(zipper)	time	(timer)
ful	(wonderful)	tion	(reaction, prediction)
here	(cohere)	th	(seventh)
in	(indecent)	there	(therefore)
ing	(singing)	word	(wordy)
ity	(rarity)	work	(worker)
less	(useless)	young	(youngster)

c) Logogram - a braille unit made up of one or more shapes having the value of a word with either a limited reference or no reference to the phonetic value in the word. There are two kinds of logograms: letter words and wordlets.

(1) Letter word - a word sign that has a shape that also can be a letter. For example, the words but, can, do, and it also have letter values. A complete list of letter words follows.

as	more
but	not
can	people
do	quite
every	rather
from	so
go	that
have	us
it	very
just	will
knowledge	you
like	

(2) Wordlet - one or more shapes carrying a word value but never a letter value. The words and, for, and with are examples of one-shape wordlets. The words day, name, had, know, and character are examples of multi-shape

wordlets, as are the abbreviational logograms known as short-form words, such as about and after (2 shapes), and braille and herself (3 shapes). A complete list of wordlets follows.

about	beside	first	neither
above	between	for	o'clock
according	beyond	friend	of
across	blind	good	one
after	braille	great	out
afternoon	by	had	ought
afterward	cannot	here	paid
again	character	him	part
against	child	immediate	perceive
almost	children	in	perceiving
already	conceive	its	perhaps
also	conceiving	know	question
although	could	letter	quick
altogether	day	little	receive
always	deceive	lord	receiving
and	deceiving	many	rejoice
be	declare	mother	rejoicing
because	declaring	much	right
before	either	must	said
behind	enough	myself	shall
below	ever	name	should
beneath	father	necessary	some

spirit	tonight	herself
St. (Street, Saint)	under	himself
still	upon	itself
such	us	myself
that	was	oneself
the	were	ourselves
their	with	themselves
there	where	thyselves
these	which	yourself
this	whose*	yourselves
those*	word	
through*	work	
time	world	
to	would	
today	your	
together	young	
tomorrow		

3. Modulations. Modulations are of two kinds: punctuation and register. These have values that affect both letters and grams.

a) Punctuation. Punctuations may:

(1) Look back--close what has gone before. A complete list follows.

colon	period
comma	question mark
exclamation point	semicolon

- (2) Enclose--warn us of their application and close their domain. A complete list follows.

bracket or brace (in pairs)

comma (in pairs)

parenthesis (in pairs)

quotation marks, single (in pairs)

quotation marks, double (in pairs)

- (3) Link--affect both what comes before and what comes after. A complete list follows.

bar

bracket or brace (one)

dash

long dash

hyphen

- b) Register. These look forward, may automatically specify where the scope terminates, and include composition signs. These modify the basic segmental values of what follows; thus they have no separate segmental counterpart in print. A complete list follows.

capital sign, single

letter sign

capital sign, double

number sign

italic sign, single

termination sign

italic sign, double

II. Categories of the Braille Code

The groupings in this section are based on specific categories of various punctographic forms used in the grade 2 braille code. These specifications are based on research on the difficulty blind children have in the discrimination of words, characters, or signs falling within these categories (Ashcroft, 1960). Specific vocabulary for each of the categories is given below. The categories are presented in order of their difficulty, from easy to difficult.

- A. Alphabet abbreviations--single letters of the alphabet which stand for a whole word.

Alphabet abbreviations were found to be the least difficult category for recognition by elementary age blind students (Ashcroft, 1960). In addition, Nolan and Kederis (1969) found that the perceptual unit in word recognition is the braille cell, and that the time required for recognition of words increases as words grow longer. Therefore, it is suggested that alphabet abbreviations, which are one-cell characters representing whole words, be among the first words introduced. These abbreviations are listed below.

Alphabet Abbreviations

<u>Alphabet Letter</u>	<u>Braille Meaning</u>	<u>Alphabet Letter</u>	<u>Braille Meaning</u>
a	a (the word <u>a</u>)	f	from
b	but	g	go
c	can	h	have
d	do	i	I
e	every	j	just

<u>Alphabet Letter</u>	<u>Braille Meaning</u>	<u>Alphabet Letter</u>	<u>Braille Meaning</u>
k	knowledge	t	that
l	like	u	us
m	more	v	very
n	not	w	will
p	people	x	it
q	quite	y	you
r	rather	z	as
s	so		

Four orders of difficulty for the alphabet abbreviations are given in the chart on page 25. These orders were established by Bloomer (n.d.), Hoffman and Cook (1970), Henderson (1967), and Kederis (1962). The order of difficulty established by Bloomer is based on the dissimilarity of the characters. The order for the Hoffman and Cook list is based on the difficulty of the letter in braille as indicated by a number of previous studies. The order established by Henderson is based on the number of errors made by students in identifying them, and the order by Kederis is based on the length of time required to recognize the letters. In order to indicate where agreement on the placement of the letters in the four lists occurs, the lists have been divided into three sections. Section I contains the easiest letters, Section II, moderately difficult letters, and Section III, most difficult letters. The capital letters in parentheses beside each alphabet abbreviation indicate the lists in which the letters occur in the same section, i.e., KC placed

beside the alphabet abbreviation "a" in the Bloomer list indicates that "a" also occurs in the same section in the Kederis and Hoffman and Cook lists. It is suggested that alphabet abbreviations which occur in Section I in three or four of the lists be introduced first, those which occur in Section I in two of the lists next, those which occur in Section II of three or four lists next, etc.

Orders of Difficulty for Alphabet Abbreviations

	<u>Bloomer</u>	<u>Hoffman and Cook</u>	<u>Henderson</u>	<u>Kederis</u>
SECTION I	1 a (KC)	a (BK)	l (B)	e
	2 t (C)	m (BK)	n	a (BC)
	3 b (KHC)	t (B)	p	i (B)
	4 m (K)	c (HK)	x (C)	c (H)
	5 l (H)	f	w	k (H)
	6 g (C)	x (H)	k (K)	b (BHC)
	7 i (K)	s (B)	b (BKC)	d (B)
	8 s (C)	g (B)	z	m (BC)
	9 r	b (BHK)	y	u (C)
	10 d (K)	u (K)	c (KC)	o
SECTION II	11 n (KC)	l (K)	a	g
	12 c	n (BK)	s (K)	j
	13 k (C)	h (BHK)	f (K)	h (BHC)
	14 h (HKC)	r (H)	r (C)	x (B)
	15 o (HC)	e (BH)	o (BC)	l (C)
	16 p (C)	p (B)	d (C)	s (H)
	17 y	o (BH)	m	n (BC)
	18 e (HC)	d (H)	h (BKC)	f (H)
	19 v (K)	k (B)	t	v (B)
	20 x (K)	i	e (BC)	z

	<u>Bloomer</u>	<u>Hoffman and Cook</u>	<u>Henderson</u>	<u>Kederis</u>
SECTION III	21 w (KC)	y (K)	g	y (C)
	22 u (H)	z (B)	v (C)	w (BC)
	23 f	v (H)	j (BC)	p
	24 q (HKC)	w (BK)	u (B)	t
	25 j (HC)	j (BH)	i	r
	26 z (C)	q (BHK)	q (BKC)	q (BHC)

B=Bloomer

Section I = least difficult

C=Hoffman and Cook

Section II = moderately difficult

H=Henderson

Section III = most difficult

K=Kederis

- B. Full spelling--words which are fully spelled out, using no contractions.

Words in full spelling were found to be the second category in terms of ease of recognition of braille words (Ashcroft, 1960).

Also, studies by Nolan and Kederis (1969) indicated that in general, short, familiar, and uncontracted words were more easily recognized by both elementary and high school level blind students than long, unfamiliar, contracted words.

- C. Upper-cell words and contractions--words and contractions which contain dots in the upper part of the cell (dots 1 and/or 4).

The third category of difficulty consists of those words in which upper contractions (symbols containing dots in the upper part of the cell) represent part of the word (Ashcroft, 1960). Nolan and Kederis (1969) define upper-cell words as those in which the majority of the

dots are in the upper part of the cell. Their studies indicated that students were able to recognize characters with the majority of their dots in the upper part of the cell more easily than those with the majority of their dots in the lower part of the cell. Henderson (1967) came to a similar conclusion, but suggested that particular attention be given to the arrangement and spacing of the dots.

On the basis of these research findings, it appears that upper-cell words and contractions should be introduced before lower-cell words and contractions when possible. If the Ashcroft (1960) definition is used, all words containing contractions with dots 1 and/or 4 would be included in the upper-cell category. If the Nolan & Kederis definition is used, only words with the majority of their dots in the upper part of the cell would fall in this category. However, words in the alphabet abbreviations, combinations of orthography, multiple cell contractions, and short form words categories which meet either of these definitions should be introduced on the basis of specifications for their individual categories first, with subsequent consideration being given to upper-cell specifications. For example, if several words are chosen from the combinations of orthography category, the selection of one of these words might be made on the basis of the specifications for the upper-cell category.

The list of upper-cell contractions from grade 2 braille given below is based on the Ashcroft definition.

Upper-Cell Contractions From Grade 2 Braille

and	ar
for	ch - child
of	gh
the	sh - shall
with	th - this
	wh - which
	ed
	er
	ou - out
	ow
	st - still
	ing
	ble

- D. Lower-cell words and contractions--words and contractions with all, or the majority, of their dots in the lower part of the cell (dots 2, 3, 5, 6).

The lower-cell words and contractions are next in order of difficulty of recognition (Ashcroft, 1960). The Nolan and Kederis studies (1969) as well as Henderson's study (1967) cited above confirm this finding. Ashcroft defines this category as words and contractions in which all the dots are in the lower part of the cell (dots 2, 3, 5, 6) or words which contain contractions with all the dots in the lower part of the cell. Nolan and Kederis define the category as words and contractions in which all the dots are in the lower part of

the cell or words in which the majority of the dots are in the lower part of the cell. It is suggested that the introduction of words in this category be delayed until students have gained some skill in identifying words in the preceding categories. Also, since words in this category may occur in other categories, the same procedures outlined in the discussion of the upper-cell category should be followed when possible. The lower-cell words and contractions in Grade 2 braille are presented below.

Lower-Cell Contractions From Grade 2 Braille

<u>Contraction</u>	<u>Punctuation</u>	<u>Contraction</u>	<u>Punctuation</u>
ea	,	to ff	!
be bb	;	were gg	()
con cc	:	his	" ?
dis dd	.	in	
en enough		was by	"
into		com	-

- E. Combinations of orthography--words containing combinations of upper-cell, lower cell, short form words, and multiple cell contractions.

This category includes words that contain two or more different types of contractions, e.g., a lower-cell and an upper-cell contraction. In general, it appears that slower readers or beginning readers have difficulty when combination of orthography occurs (Ashcroft, 1960; Henderson, 1967; Nolan & Kederis, 1969).

- F. Multiple cell contractions--whole word contractions made up of two or more cells, or words which contain part word contractions made up of two or more cells.

This is the sixth category in the order and can be difficult for visually handicapped children to master. Therefore, the introduction of words in this category should be gradual. Multiple cell contractions from grade 2 braille are listed below.

Multiple-Cell Contractions From Grade 2 Braille

Dot 5 words and part words

day	young
ever	there
father	character
here	through
know	where
lord	ought
mother	

name	<u>Dots 4-5 words</u>
------	-----------------------

one	upon
part	word
question	these
right	those
some	whose
time	
under	
work	

Dots 4-5-6 words

cannot

had

many

spirit

world

their

Dots 5-6 part words

-ence

-ong

-ful

-tion

-ness

-ment

-ity

Dots 4-6 part words

-ound

-ance

-sion

-less

-ount

Dot 6 part words

-ation

-ally

- G. Short form words--contractions using from 2 to 6 letters to represent a word.

This is the most difficult of the categories of the braille code (Ashcroft, 1960), and extra care should be taken in the introduction of these words. If possible, the introduction of these words should be delayed until other categories have been introduced, although some of the common short form words may be presented earlier. Short form words in grade 2 braille are listed in terms of word patterns since their introduction in patterns should facilitate their recognition by students.

Short Form Word Patterns From Grade 2 Braille

1. Short forms containing initial and final letters without contractions

cd	could	hm	him	pd	paid	wd	would
gd	good	lr	letter	qk	quick	yr	your
grt	great	myf	myself	sd	said		

2. Short forms containing initial and final letters with contractions

<u>chn</u>	children	<u>herf</u>	herself	<u>mst</u>	must	<u>sch</u>	such
<u>fst</u>	first	<u>mch</u>	much	<u>shd</u>	should		

3. Short forms containing consonants only without contractions or other short forms

bl	blind	gd	good	qk	quick	tm	tomorrow
brl	braille	grt	great	rcv	receive	tn	tonight
cd	could	hm	him	rjc	rejoice	wd	would
dcv	deceive	lr	letter	sd	said	yr	your
dcl	declare	ll	little	td	today	abv	above
fr	friend	pd	paid	tgr	together		

4. Short forms containing consonants only with contractions or other short forms

<u>chn</u>	children	<u>xs</u>	its	<u>rjcg</u>	rejoicing
<u>dcvg</u>	deceiving	<u>xf</u>	itself	<u>shd</u>	should
<u>dclg</u>	declaring	<u>mch</u>	much	<u>sch</u>	such
<u>fst</u>	fast	<u>mst</u>	must	<u>yrf</u>	yourself
<u>hmf</u>	himself	<u>rcvg</u>	receiving	<u>yrvs</u>	yourselves

5. Initial sequence short forms without contractions

ab	about	alr	already	fr	friend
ac	according	al	also	imm	immediate
acr	across	alt	altogether	nec	necessary
af	after	alw	always	nei	neither
ag	again	bl	blind	o'c	o'clock
alm	almost	ei	either		

6. Initial sequence short forms with contractions

<u>alth</u>	although	<u>bel</u>	below	<u>bet</u>	between
<u>bec</u>	because	<u>ben</u>	beneath	<u>bey</u>	beyond
<u>bef</u>	before	<u>bes</u>	beside	<u>perh</u>	perhaps
<u>beh</u>	behind				

7. Short forms on which other forms are based

af	after	afn	afternoon
		afw	afterward
ag	again	agst	against
dcv	deceive	devg	deceiving
dcl	declare	dclg	declaring
hm	him	hmf	himself
x	it	xs	its
		xf	itself
<u>perc</u>	perceive	<u>percvg</u>	perceiving
rcv	receive	rcvg	receiving
rjc	rejoice	rjcg	rejoicing
yr	your	yrf	yourself
		yrvs	yourselves

8. Short forms based on "-self"

<u>herf</u> herself	<u>ourvs</u> ourselves
hmf himself	<u>themvs</u> themselves
xf itself	<u>thyf</u> thyself
myf myself	yrf yourself
<u>onef</u> oneself	yrvs yourselves

9. Short forms based on "-ceive"






































<u>concv</u> conceive	<u>percv</u> perceive
<u>concv</u> g conceiving	<u>percv</u> g perceiving
dcv deceive	rcv receive
dcvg deceiving	rcg receiving











The following chart summarizes the reversal and alignment relationships in the braille code.

Braille Code Reversal and Alignment Relationships

Basic Shape & No. of Positions	Exact Position in Cell	Braille Meaning	Reversed Position in Cell	Braille Meaning
• (6)	⠠	a	⠠	accent sign
	⠠	ea, comma	⠠	dot 5 contractions
	⠠	apostrophe	⠠	capital, dot 6 contractions

Basic Shape & No. of Positions	Exact Position in Cell	Braille Meaning	Reversed Position in Cell	Braille Meaning
• (4)	⠠	b, but	⠠	dot 4, 5 contractions
	⠡	be, bb, semicolon	⠡	letter sign, dot 5, 6 contractions
•• (3)	⠢	c, can		
	⠣	con, cc, colon		
	⠤	com, hyphen		
•• (4)	⠥	e, every	⠥	i
	⠦	en, enough	⠦	in
• (2)	⠧	k, knowledge	⠧	dot 4, 6 contractions, italic sign, decimal point
•• (2)	⠨	ch, child	⠨	st, still
••• (8)	⠩	d, do	⠩	f, from
	⠪	dis, dd, period	⠪	to, ff, exclamation
	⠫	h, have	⠫	j, just
	⠬	his, opening double quotation, question mark	⠬	was, by, closing double quotation

Basic Shape & No. of Positions	Exact Position in Cell	Braille Meaning	Reversed Position in Cell	Braille Meaning
 (4)		m, more		sh, shall
		u, us		ing
 (2)		l, like		dot 4, 5, 6 contractions
 (4)		s, so		wh, which
		gh		ar
 (2)		o		ow
 (2)		g, go		
		gg, opening or closing parenthesis, were		
 (4)		n, not		ed
		z, as		the
 (4)		p, people		th, this
		v, very		ble, number sign
 (2)		r, rather		w, will
 (2)		t, that		ou, out
 (1)		x, it		

Basic Shape & No. of Positions	Exact Position in Cell	Braille Meaning	Reversed Position in Cell	Braille Meaning
 (4)		q, quite		er
		of		with
 (2)		y, you		and
 (1)		for, full cell		

III. Research in Types of Errors

A. Frequently confused characters

It has been established that characters which are similar in shape are among those most easily confused by visually handicapped children in their reading (Kederis, 1962). It is suggested, therefore, that such characters not be introduced together in the early stages of reading. However, there should be a gradual progression toward the use of these characters together, accompanied by appropriate drills and experience in reading. The table below lists the 55 one-cell characters in grade 2 braille and the characters which are similar in shape and with which they are most easily confused (Kederis, 1962). These confusors were identified by presenting the characters in isolation and by establishing recognition times for them. They were not presented in any reading context. This fact should be taken into consideration when using the chart below for selecting vocabulary for testing purposes.

CHARACTER	CONFUSOR(S)			
for	g, go f, from	q, quite j, just	b, but er	gg, were, parentheses () and
q	f, from i	p, people m, more	g, go	b, but
of	v, very r, rather	h, have l, like	ou, out	g, go
er	th, this w, will	d, do	g, go	ed
with	ble for	j, just	t, that	g, go
y	x, it	n, not		
and	x, it	ed		
r	h, have o	f, from	b, but	l, like
ou	wh, which h, have	e, every en, enough	d, do	gh
ed	sh, shall e, every	f, from	m, more	gh

CHARACTER	CONFUSOR(S)			
t	j, just in	i	s, so	ar
w	j, just	d, do	b, but	
p	f, from i	m, more	b, but	s, so
z	wh, which	o	ch, child	
v	h, have	gh	u, us	
x	m, more	ing	u, us	
g	d, do	f, from	h, have	c, can
dis	d, do	cc, con, colon:	c, can	
was	in	j, just		
ff	f, from	in	i	
ow	s, so	ed		

CHARACTER	CONFUSOR(S)
•• con	•• c, can
•• com	•• cc, con, colon:
• k	
• e	
•• j	• i •• c, can
• ing	• st, still, bar/ fraction line / or - • u, us
• wh	• e, every
• sh	• ch, child
• in	• i
• en	• e, every
• b	• a
•• c	• a
• ea	• a

CHARACTER	CONFUSOR(S)
• • • o	
• • • u	• • ch, child
• • • m	• k, knowl- edge • sh, shall
• • • d	• • c, can
• • bb	• • b, but
• • ch	• • e, every
• • st	
• • • i	
• • a	• • c, can

B. Frequency of errors for clusters of characters

Henderson (1967) found that certain characters seem to group together in terms of the frequency with which they are missed by braille readers. These clusters, in general, consist of characters which are similar in configuration, but are missed because of reversals, missed dots, or other error types. The clusters are listed below in ascending order of difficulty.

Cluster	Braille Sign
1. l	
2. x	
3. for	
4. y	
and	
5. r	
w	
6. t	
ou	
7. o	
ow	

Cluster	Braille Sign
8. a	
ea	
9. b	
bb	
10. the	
ed	
z	
n	
11. v	
th	
ble	
p	

Cluster	Braille Sign
---------	--------------

12. g	
-------	--

gh	
----	--

13. k	
-------	--

ch	
----	--

st	
----	--

14. ar	
--------	--

gh	
----	--

s	
---	--

wh	
----	--

15. c	
-------	--

con	
-----	--

com	
-----	--

Cluster	Braille Sign
---------	--------------

16. e	
-------	--

i	
---	--

en	
----	--

in	
----	--

17. q	
-------	--

of	
----	--

with	
------	--

er	
----	--

18. sh	
--------	--

ing	
-----	--

u	
---	--

m	
---	--

19. d	
-------	--

f	
---	--

h	
---	--

j	
---	--

C. Orders of difficulty

The following section contains the orders of difficulty for the 55 one-cell characters of grade 2 braille established by Bloomer (n.d.), Henderson (1967), and Kederis (1962). Bloomer's order of difficulty is based on the assumption that characters which are most different in configuration are most easily discriminated. Henderson's order was derived by analyzing the number of errors made by students in identifying the characters. Kederis' order is based on recognition time for each of the characters. An additional chart orders one-cell characters according to number of dots.

Orders of Difficulty 55 One-Cell Characters of Grade 2 Braille

<u>Bloomer</u>	<u>Henderson</u>	<u>Kederis</u>
1. a	l	e
2. t	n	a
3. b	p	i
4. m	x	c
5. l	w	k
6. g	k	st
7. i	b	b
8. s	z	com
9. r	ed	ch
10. d	ou	in
11. n	and	sh
12. c	y	ea
13. k	c	d

<u>Bloomer</u>	<u>Henderson</u>	<u>Kederis</u>
14. h	for	m
15. o	a	u
16. p	s	o
17. y	f	bb (be)
18. e	r	ing
19. v	o	ow
20. x	d	con (cc)
21. w	m	c
22. u	ble	wh
23. f	h	en
24. q	t	j
25. j	e	h
26. z	ar	his
27. and	ow	ar
28. ing	g	gh
29. to (ff)	th	th
30. of	v	x
31. the	ea	the
32. by (was)	er	l
33. for	j	s
34. ou	st	n
35. th	wh	f
36. in	the	ff (to)
37. st	in	ble
38. his	gh	v

	<u>Bloomer</u>	<u>Henderson</u>	<u>Kederis</u>
39.	sh	ch	gg (were)
40.	with	with	and
41.	ed	be (bb)	z
42.	ch	u	was (by)
43.	were (gg)	en	dis (dd)
44.	en	were (gg)	y
45.	wh	was (by)	w
46.	ar	dis (dd)	p
47.	ea	i	ed
48.	er	of	with
49.	be (bb)	con (cc)	er
50.	ow	ff (to)	t
51.	ah	q	of
52.	dd (dis)	com	ou
53.	cc (con)	sh	r
54.	com	ing	for
55.	ble	his	q

The 55 One-Cell Characters In Order of Number of Dots

<u>Number of Dots</u>	<u>Character</u>	<u>Number Of Dots</u>	<u>Character</u>	<u>Number Of Dots</u>	<u>Character</u>			
1.	1	a	5.	2	c, can	9.	2	en, enough
2.	1	ea, comma	6.	2	con, cc, colon	10.	2	i
3.	2	b, but	7.	2	com, hyphen	11.	2	in
4.	2	be, bb, semicolon	8.	2	e, every	12.	2	k, knowledge

<u>Number Of Dots</u>	<u>Character</u>	<u>Number Of Dots</u>	<u>Character</u>	<u>Number Of Dots</u>	<u>Character</u>			
13.	2	ch, child	26.	3	ing	41.	4	v, very
14.	2	st, still	27.	3	l, like	42.	4	th, this
15.	3	d, do	28.	3	s, so	43.	4	ble, number sign
16.	3	dis, dd, period	29.	3	gh	44.	4	r, rather
17.	3	f, from	30.	3	wh, which	45.	4	w, will
18.	3	to, ff, exclamation	31.	3	ar	46.	4	t, that
19.	3	h, have	32.	3	o	47.	4	ou, out
20.	3	his, opening double quotation question mark	33.	3	ow	48.	4	x, it
21.	3	j, just	34.	4	g, go	49.	5	q, quite
22.	3	was, by, closing double quotation	35.	4	gg, were, opening or closing parenthesis	50.	5	of
23.	3	m, more	36.	4	n, not	51.	5	er
24.	3	u, us	37.	4	z, as	52.	5	with
25.	3	sh, shall	38.	4	ed	53.	5	y, you
			39.	4	the	54.	5	and
			40.	4	p, people	55.	6	for, full cell

Section III
Existing Braille and Tactile Tests

This section of the specifications contains bibliographic information and brief summaries of tests that have been developed within the last 20 years for use with braille students. Most of these tests are not currently being produced or utilized. Advertising or distribution policy may be at fault, as some of these devices have valid application in the field. It should be noted that some of the tests reported in the literature could not be obtained for review. In this case the manual or technical report of the test was reviewed.

Several of the measures listed are based on tests devised to measure print reading ability and do not take into consideration the unique characteristics of braille. This is a valid approach for comprehension level testing as most of the material read by students is brailled directly from print subject areas. However, for specific diagnostic purposes, these unique braille characteristics must be taken into consideration.

Several authors of the tests had a valid approach in their developmental specifications, and seemed to carry this through in the format of their tests; however, the lack of a standardized test in braille to compare a newly devised test was noted in their development reports. This produces a lack of confidence in the stated effectiveness of some of these measures listed. If this fact is corrected it can be seen that, in the future, a standardized braille competency test would be useful beyond its diagnostic possibilities. Development comparisons are needed when developing tests to evaluate other aspects of the braille student's education.

Measurement Devices Evaluated for the Development of a
Diagnostic Test of Braille Reading Skills

Berger, A. Adaption and evaluation of an informal reading inventory for the blind. Carbondale: Southern Illinois University, 1968.

The Braille Informal Reading Inventory is based on selected diagnostic tests within the Sheldon Basic Series, Grades 1-7. Oral presentation of passages tests accuracy at the independent, instructional, and frustrational reading levels. When the frustration level is reached, the examiner tests the student's listening comprehension.

Czerwinski, M. H. Braille recognition level tests for reading and mathematics. Newark: New Jersey Commission for the Blind, 1981.

The reading aspect is a short test of recognition of braille grade II contractions. Students are required to recognize these contractions in words and sentences, however, the series of tests does not present contractions in all of their possible contexts.

Hanley, L. F. A diagnostic test of grade two braille misperceptions: A pilot study. Boston: Boston University, 1965.

A battery of individual diagnostic tests to measure the various grade II perception abilities. Three components are included in the testing material: (1) an objective record of the frequency of braille misperceptions, (2) a profiled analysis of perception errors according to kinds of braille orthography and specific categories of misperceptions, and (3) a measure of performance on a five level scale of letter and/or word knowledge.

Lorimer, J. The Lorimer braille recognition test. Bristol, England: The College of Teachers of the Blind, 1962.

This word-recognition test measures the ability to feel the shapes and give the means of 174 unrelated word signs and contractions. Because the test presents word signs and contractions in isolated words, it is not a test of reading ability, although a close correlation might be expected.

Lorimer, J. Neale analysis of reading ability: Adapted for use with blind children. Windsor, England: NFER Publishing Company, 1977.

An adapted reading test which provides quantitative measures of accuracy, comprehension, and rate in reading. The test yields diagnostic information on specific difficulties and indicates the type of remediation needed.

Sprung, M. B. Braille book of tests. Philadelphia: Overbrook School for the Blind, 1961.

A series of short tests using categories similar to Ashcroft's. Presents contractions in isolation and sentences. The test includes writing as well as recognition. No standardized approach was used in the development of this series.

Tooze, F. H. G. The Tooze braille speed test. Bristol, England: The College of Teachers of the Blind, 1962.

This is a speed test which seeks to give a quick appraisal of a student's ability to read braille characters. The test consists of 20 three-letter words, none of which involves any grade II braille contractions. A raw score is obtained which is used to compute a reading age and/or a standard score which indicates the student's positive or negative deviation from the mean.

Woodcock, R. W., & Bourgeault, S. E. Construction and standardization of a battery of braille skills test (Colorado braille battery, technical report 1.). Greeley: Colorado State College, 1964.

This test is designed to discover how well the subject know the elements of the braille codes (Grade 2 literary code & Nemeth code for mathematical notation) and the rules governing their use. A literary Pretest is included to determine which of the three levels of the Literary Code Test would be most appropriate for use when the examiner does not have prior information on the subject's skill in braille. The three levels are best given in grades one through four.

Boehm, A. E. Boehm test of basic concepts. Tactile revision by H. Caton, The tactile test of basic concepts (Form A). Louisville, Kentucky: American Printing House for the Blind, 1971. (Original copyright 1967-1970, 1971.)

Newland, T. E. The blind learning aptitude test manual. Urbana: University of Illinois, 1969.

Nolan, C. Y., & Morris, J. E. Roughness discrimination test manual. Louisville, Kentucky: American Printing House for the Blind, 1965.

The above three tests are not tests of braille reading ability and do not contain any actual braille characters. Rather, they are used in predicting the tactile ability to read braille, and in the case of The Tactile Test of Basic Concepts, the evaluation of the level of concept development in young children.

Several tests mentioned here asked for a variety of information concerning the students taking the test. This will be an important part of the data collected during the field trial. The following list is suggested.

name of student

birthdate

school & location

grade in school

number of years in school

number of years using braille

sex

handedness

vision rating

etiology of eye disease

age of onset of blindness

home address

intelligence quotient and date of administration

achievement test scores & date of administration

date of administration of braille test.

TESTING OF THE BRAILLE CODE

Bibliography

- American Association of Workers for the Blind. Report of the Uniform Type Committee, 1907. Outlook for the Blind, 1907-1908, 1, 154-175.
- American Association of Workers for the Blind. Report of the Uniform Type Committee, 1909. Outlook for the Blind, 1910-1911, 4, 73-82.
- American Association of Workers for the Blind. Report of the Uniform Type Committee, 1911. Outlook for the Blind, 1911-1912, 5, 1-12.
- American Association of Workers for the Blind. Report of the Uniform Type Committee, 1913. Outlook for the Blind, 1913, 7, 1-48.
- American Association of Workers for the Blind. Report of the Uniform Type Committee, 1915. Outlook for the Blind, 1915, 9, 1-92.
- American Association of Workers for the Blind. Report of the Uniform Type Committee, 1917. Outlook for the Blind, 1917, 11, 1-14.
- American Printing House for the Blind. English braille American edition 1959. Louisville, Kentucky: American Printing House for the Blind, 1972.
- Ashcroft, S. C., & Henderson, F. Programmed instruction in braille. Pittsburgh: Stanwix House, © 1973.
- Bell, D. Reading braille. The New Beacon, 1971, LV, 239.
- Berger, A. Adaptation and evaluation of an informal reading inventory for the blind. Carbondale: Southern Illinois University, 1968.
- Bloomer, R. H., & Anchel, M. A progressive part braille program for teaching educationally handicapped blind students. New York: The Jewish Guild for the Blind, n.d.

- Boehm, A. E. Boehm Test of basic concepts. Tactile revision by H. Caton, The tactile test of basic concepts (Form A). Louisville, Kentucky: American Printing House for the Blind, 1971. (Original copyright 1976-1970, 1971.)
- Caton, H., Pester, E., & Goldblatt, S. Specifications for selecting a vocabulary and teaching method for beginning braille readers. New York: American Foundation for the Blind Research Report, 1979.
- Crandell, J. M., Jr., & Wallace, D. H. Speed reading in braille: An empirical study. New Outlook for the Blind, 1974, 68, 13-19.
- Czerivinski, M. H. Braille recognition level tests for reading and mathematics. Newark: New Jersey Commission of the Blind, 1981.
- Fertsch, P. An analysis of braille reading. Outlook for the Blind and the Teacher's Forum. 1946, 40, 128-131.
- Fertsch, P. An analytic study of braille reading. Austin: University of Texas, 1942.
- Fields, J. Sensory training for blind persons. New Outlook for the Blind, 1964, 58, 2-9.
- Gill, J. M. A study of braille contractions. Coventry, England: University of Warwick, 1978.
- Gore, B. V. III. The effects modes of oral presentation have on certain cognitive skills. New Outlook for the Blind, 1970, 64, 86-88.

- Hanley, L. F. A diagnostic test of grade two braille misperceptions: A pilot study. Boston: Boston University, 1965.
- Harley, R. K., Henderson, F. M., & Truan, M. The teaching of braille reading. Springfield: Charles C. Thomas, 1979.
- Henderson, F. Analysis of errors in braille word recognition. Nashville: George Peabody College for Teachers, n.d.
- Henderson, F. M. The effect of character recognition training on braille reading. Specialist in education thesis, George Peabody College, 1967.
- Kederis, C. J. The legibility of braille characters. Master's thesis, University of Louisville, 1962.
- Kederis, C. J., Nolan, C. Y., & Morris, J. E. The use of controlled exposure devises to increase braille reading rates. Louisville, Kentucky: American Printing House for the Blind, n.d.
- Kusajima, T. Visual reading and braille reading: An experiment investigation of the physiology and psychology of visual and tactual reading. New York: American Foundation for the Blind, 1974.
- Lappin, J., & Foulke, E. Expanding the tactual field of view. Perception and Psychophysics, 1973, 14, 237-241.
- Lorimer, J. Neale analysis of reading ability: Adapted for use with blind children. Windsor, England: NFER Publishing Company, 1977.
- Lowenfeld, B., & Able, G. L. Methods of teaching braille reading. San Francisco: San Francisco State College, 1967.

- Lowenfeld, B., Abel, G. L., & Hatlen, P. H. Blind children learn to read.
Springfield, Illinois: Charles C. Thomas, 1969.
- Newland, E. T. Manual: The Blind learning aptitude test. Urbana: University
of Illinois, 1969.
- Nolan, C. Y. Reading and listening in learning by the blind. Exceptional
Children, 1963, 29, 313-316.
- Nolan, C. Y., & Kederis, C. J. Perceptual factors in braille word recogni-
tion. American Foundation for the Blind, Research Series, 1969, No. 20.
- Nolan, C. Y., & Morris, J. E. Roughness discrimination test manual. Louis-
ville, Kentucky: American Printing House for the Blind, 1965.
- Pittman, V. G. Reading readiness. The New Outlook for the Blind, 1964, 59,
322-324.
- Sprung, M. B. Braille book of tests. Philadelphia: Overbrook School for the
Blind, ©1961.
- Tinker, M. A. Tinker speed of reading test. Revised by R. P. Carver, Basic
reading rate scale (Form A). Silver Springs, Maryland: Revrac Publica-
tions, ©1970. (originally copyrighted 1947, 1955.)
- Tooze, F. H. G. The Tooze braille speed test. Bristol, England: The Col-
lege of Teachers of the Blind, 1962.
- Umsted, R. G. Improvement of braille reading through code recognition train-
ing. Doctoral dissertation, George Peabody College for Teachers, 1970.

Universities of Birmingham and Warwick. A study of braille contractions:
Aims, methods, and summary (Vol. 1). London: The Department of Health
and Social Security, 1980.

Woodcock, R. W., and Bourgeault, S. E. Construction and standardization of
battery of braille skills test (Colorado braille battery, technical report
1.). Greeley: Colorado State College, 1964.



1. Letters

a. Alphabetic letters (26)

b. Non-alphabetic letters

(1) 0-9

decimal point
fraction bar

(2) Other braille units with abstract letter-like function

accent sign
apostrophe
asterisk
ellipsis
hyphen or dash--when used to indicate missing letters or words

2. Grams

a. Phonograms

ally (Sally)
ance (dance)
and (sand)
ar (car)
ation (nation)
bb (rubber)
ble (table)
cc (occur)
ch (chair)
com (come)
con (contrary)
dd (paddle)
dis (dispel)
ea (read)
ed (red)
en (pen)
ence (fence)
er (certain)
ever (several)
ff (duffle)
for (forest)
ful (awful)
gg (suggest)
gh (ghost)
here (adhere)
in (pin)
ing (sing)
ity (city)

less (bless)
ment (momento, comment)
ness (finesse, business)
of (offer, off, doff)
one (none, alone, honest, money, cone)
ong (along, wrong, tongue, longingly)
ou (bout, thou, coup, coupe, hiccough, soup)
ought (fought, bought, brought, thought)
ound (wound, sound)
ount (count)
ow (now, cow, brown)
part (party, impartial)
right (fright, sprightly)
sh (wash, wish)
sion (mission, fusion)
some (handsome)
st (first, street)
th (thou, bath, thing)
the (theatre, bathe, thee)
tion (faction, portion, notion)
under (thunder)
wh (what, whether, who)
with (within)

b. Morphograms

after	(afterlife)	ment	(ornament, monument)
ally	(mathematically)	ness	(openness, oneness)
ance	(avoidance)	one	(oneness)
and	(multiplicand)	part	(partial)
ar	(secular)	paid	(unpaid, repaid)
ation	(admiration)	question	(unquestionably, unquestionable)
be	(befriend)	quick	(quickly)
com	(commiserate)	right	(righteous, rightful)
con	(confuse)	said	(unsaid)
dis	(disengage)	sion	(aversion, confusion)
ed	(rubbed)	some	a- (loathsome)
en	(encephalogram)	spirit	(spiritual, dispirited)
ence	(providence)	through	(throughout, throughway)
er	(zipper)	time	(timer)
ful	(wonderful)	tion	(reaction, prediction)
here	(cohere)	th	(seventh)
in	(indecent)	there	(therefore)
ing	(singing)	word	(wordy)
ity	(rarity)	work	(worker)
less	(useless)	young	(youngster)

c. Logograms

(1) letter word

as	knowledge	very
but	like	will
can	more	you
do	not	
every	people	
from	quite	
go	rather	
have	so	
it	that	
just	us	



(2) Wordlet

about	for	still
above	friend	such
according	good	that
across	great	the
after	had	their
afternoon	here	there
afterward	him	these
again	his	this
against	immediate	those*
almost	in	through*
already	its	time
also	know	to
although	letter	today
altogether	little	together
always	lord	tomorrow
and	many	tonight
be	mother	under
because	much	upon
before	must	us
behind	myself	was
below	name	were
beneath	necessary	with
beside	neither	where
between	o'clock	which
beyond	of	whose*
blind	one	word
braille	out	work
by	ought	world
cannot	paid	would
character	part	your
child	perceive	young
children	perceiving	
conceive	perhaps	
conceiving	question	
could	quick	
day	receive	herself
deceive	receiving	himself
deceiving	rejoice	itself
declare	rejoicing	myself
declaring	right	oneself
either	said	ourselves
enough	shall	themselves
ever	should	thysself
father	some	yourself
first	spirit	yourselves
	St.(Street, Saint)	

3. Modulations

a. Punctuation

(1) look back

colon
comma
exclamation point
period
question
semicolon

(2) enclose

bracket or brace (in pairs)
comma (in pairs)
parenthesis (in pairs)
quotation marks, single (in pairs)
quotation marks, double (in pairs)

bar (in pairs) ;

(3) link

bar
bracket or brace (one)
dash
long dash
hyphen

b. Register

capital sign, single
capital sign, double
italic sign, single
italic sign, double
letter sign
number sign
termination sign





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